lique-angled parallelogram, or rhomboid, of which AE and AD are the sides, and ED and AF the diagonals.

Let $x=BE=CD$, and put $a=AD$, $b=AE$, $c=ED$, and $d=AF=BC$, taking $c>d$. Then $2x+d=c$, and $x=(c-d)/2$. If $d>c$, AE and AD fall inside of AB and AC, and the hypotenuse BC would be *contracted* instead of *extended.*

We now find integral values for a, b, c, and d. This has been done in the solution of No. 42, in this issue, and need not be reproduced here.

By this process we find integral values for all the lines except the two legs, AB and AC, of the right-angled triangle. By means of the median and the perpendicular upon BC, we readily find

$$\overline{AB}^2=d[4b^2-(c-d)^2]/4c \text{ and } \overline{AC}^2=d[4a^2-(c-d)^2]/4c.$$

Now, if these expressions can be rendered squares, without destroying the relations of a, b, c, and d, AB and AC will also be rational and integral. But I have not yet succeeded in accomplishing this. We shall now illustrate by means of a few examples.

From Diophantine problem No. 42, take the set of values, $a=4$, $b=7$, $c=9$, and $d=7$. Then $2x+7=9$; whence $x=1$. $\therefore$ $AD=4$, $AE=7$, $ED=9$, $BC=AF=7$, $BE=DC=1$, $\overline{AB}^2=112/3$, and $\overline{AC}^2=35/3$.

Take the set of values, $a=8$, $b=11$, $c=17$, and $d=9$. Then $2x+9=17$; and $x=4$. Also $\overline{AB}^2=945/17$, and $\overline{AC}^2=432/17$.

Partial solutions also received from *J. H. DRUMMOND*, *A. H. BELL*, and the *PROPOSER*.

PROBLEMS.

51. Proposed by H. C. WILKES, Skull Run, West Virginia.

The difference between the roots of two successive triangular square numbers equals the sum of two successive integral numbers, the sum of whose squares will be a square number. Demonstrate.

52. Proposed by O. W. ANTHONY, M. Sc., Professor of Mathematics and Astronomy, New Windsor College, New Windsor, Maryland.

Prove that a "magic square" of nine integral elements, whose rows, columns, and diagonals have a constant sum, is only possible when this sum is a multiple of three.